



# SKYWATCH

## Spotter News

National Weather Service, Pendleton, OR [www.wrh.noaa.gov/pendleton](http://www.wrh.noaa.gov/pendleton)

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### THUNDERSTORMS, RECORD HEAT, FOREST FIRES, AND FLASH FLOOD HIT REGION IN JULY

By Jeremy Wolf (Forecaster Intern)

July was a very active month in terms of the amount of severe weather east of the Cascades. The first severe weather event occurred on the seventh, when thunderstorms with gusty winds and large hail moved through many areas. Franklin county saw property damage of \$770,000, with the highest wind gust of 84 MPH measured by spotter Franklin 8H (10 miles northeast of Pasco). These winds flipped two small airplanes at the Pasco airport where winds gusted to 76 mph. The next event was the heat wave from July 10<sup>th</sup> to the 14<sup>th</sup> which broke several daily high temperature records. A few locations reported all time record high temperatures. The hottest temperature recorded during this period was 115 degrees at Monument. On the 18<sup>th</sup>, a flash flood near Wallowa Lake destroyed a dining hall, with total property damage around one million dollars. Finally, several major wildfires were ignited by lightning during the month, including the Eyerly fire (Jefferson County) which destroyed several structures, with an estimated damage at 5.5 million dollars. Other large wildfires were ignited by lightning in Grant, Baker and Crook counties.

Other significant events since April included; April 14<sup>th</sup> when wind gusts to 66 mph was measured in the Yakima Valley, downing large trees, and causing \$100,000 damage. On August 25<sup>th</sup> heavy rain occurred in Bend from a thunderstorm that moved through the area, flooding several underpasses.

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### ARE YOU WET OR DRY?

By Marilyn Lohmann (Hydrologist)

The Water Year, October 1, 2001 through September 30, 2002, started very promising with near normal precipitation, but ended dry. From October through February, precipitation was near normal. However, the normally wet months of Spring were drier than normal, especially in the Deschutes and John Day Basins of Oregon. Dry conditions prevailed through the summer months and into September with numerous locations seeing little or no precipitation during August and September. Overall, precipitation for the water year was generally below normal. This was especially true in central and northeast Oregon where Deschutes, Gilliam, Jefferson, Morrow, Sherman, Umatilla, Union, Wasco and Wheeler Counties continue to have Drought Declarations in effect.

Station (OR)	Precipitation Total	Percent of Normal	Station (WA)	Precipitation Total	Percent of Normal	Precipitation for the water year Oct 2001- Sep 2002.
Bend	7.42	63%	Cle Elum	20.41	91%	
Boardman	6.22	71%	Connell 1W	7.56	92%	
Condon	10.05	72%	Dayton	16.56	90%	
Heppner	8.93	64%	Glenwood	40.84	133%	
John Day	7.35	55%	Goldendale	15.10	85%	
Joseph	16.52	121%	Kennewick	5.03	61%	
Madras 2N	6.49	54%	Whitman Mission	12.89	94%	
Mitchell	10.39	83%	Yakima	8.15	102%	
Monument	9.26	68%				
Moro	7.92	71%				
Pendleton Exp Stn	12.26	75%				

# Interpreting Surface Weather Maps Part 2: Surface Fronts

By Mary Smith (Forecaster)

Analyzing surface plots on a surface weather map was discussed in the spring newsletter of [Skywatch](#). Part 2 in this newsletter will discuss the various weather fronts and what physical processes occur with each front.

A front is defined as the transition zone between two different air masses.

The zone typically ranges from 20-100 miles across. From one side of a front to the other, the properties of an air mass change significantly (e.g., contrasts in temperature and dew point, wind direction, cloud cover, and on-going weather). Fronts are classified according to their movement and are indicated by the direction the pips are pointing on a front symbol. Pips pointing on either side of the front indicate little or no movement and are called stationary fronts. Cold fronts are color coded as blue, warm fronts as red, occluded fronts as purple, and stationary fronts as alternating red and blue.

## What is a warm front?

A warm front (top of figure 2) is the boundary that forms when a warm air mass pushes against a colder air mass. The lighter, warmer air rises and glides over the colder, denser air mass. As this warmer air rises, it cools and may become saturated with moisture. Clouds will form and gradually lower with precipitation occurring as the front approaches. Warm fronts often form to the east of low pressure centers, where southerly winds push warm air northward.

## What is a cold front?

A cold front (bottom of figure 2) is a boundary between warm and cold air where the cold air moves in to replace the warm air. As a cold front moves into an area, the heavier, cool air pushes under the lighter, warm air it is replacing. The warm air cools as it rises. If the rising air is moist enough, clouds will form eventually producing precipitation. As a cold front approaches your location, the barometric pressure will fall and then rise sharply after the front passes. Winds ahead of a cold front tend to be from a southerly direction while those behind the front - in the cooler air - tend to be northwesterly. The typical progression of events during a storm is a warm frontal passage followed later by the cold front.

## What is an occluded front?

In the later stages of a storm's life cycle, a frontal occlusion often occurs. Because cold fronts and warm fronts can move at different speeds, cold fronts can catch up to and overtake warm fronts. When this happens, an occluded front is formed.

## What is a stationary front?

Many fronts slow down and stall over a region for up to several days, thereby developing into a stationary front. Directions that upper-level winds are blowing in relation to the front and terrain determine whether the front moves or stalls. Upper-level winds that are perpendicular to the surface front keep the front moving. However, when the upper-level winds change direction to blow along the front, winds are no longer pushing the front and it stalls. Stationary fronts often dissipate, but can become moving fronts again if the upper-level winds become more perpendicular to the front and begin to push it along. Fronts can also become stationary along terrain, such as the Cascades or Blue Mountains. Look for Part 3 of interpreting surface weather maps in the 2003 Spring [Skywatch](#).

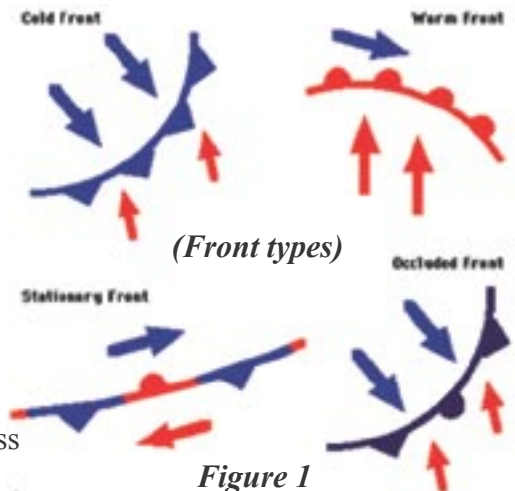


Figure 1

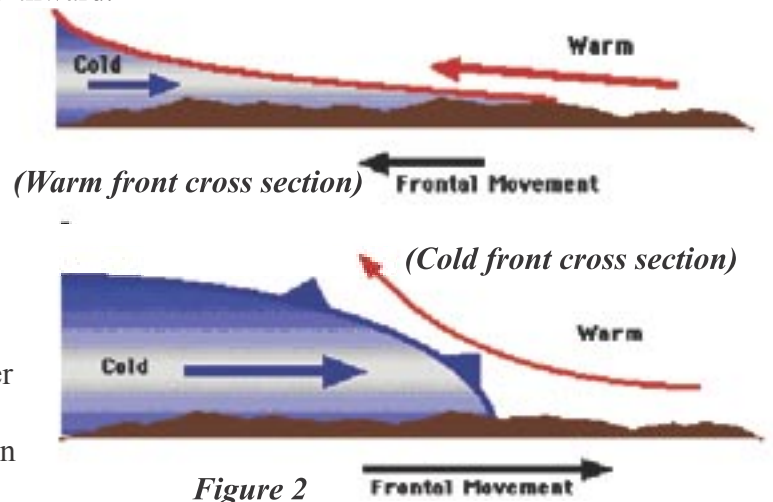


Figure 2

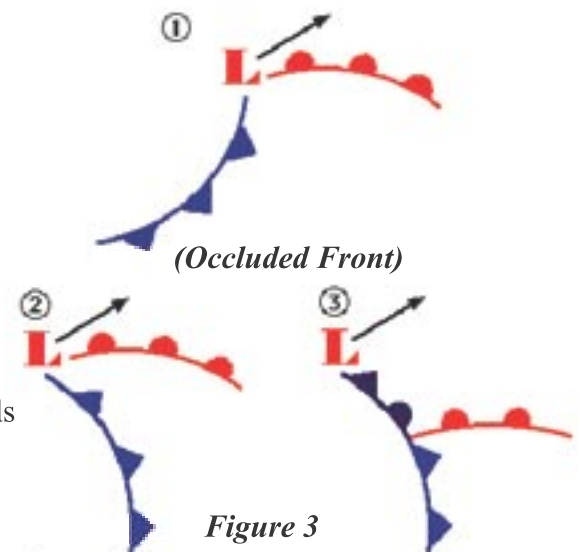


Figure 3

## Latest outlook for the winter ahead in the Northwest?

By Jon Mittelstadt (SOO)

Currently, across the eastern portion of the tropical Pacific Ocean region, easterly trade winds are weaker than average and sea surface temperatures are 1-4 degrees F warmer than average. These and other conditions indicate that a moderate El Nino is in progress.

The latest NWS climate outlook states that for the Pacific Northwest a dry winter is slightly more likely than a normal or wet winter. The outlook calls for warm or normal temperatures to be slightly more likely during the winter months. This outlook is based primarily on looking at the history of past weak to moderate El Ninos. Winters in the Pacific Northwest have typically been dry and not on the cold side during those periods.

## Winter Arrives Early

A blast of unusual cold arctic air arrived at the end of October making for a very chilly Halloween. There were numerous record low temperatures set on the last two days of October. Some of the Record lows were all-time low temperatures for the month of October. This includes a preliminary new all-time Oregon state record low for the month of October of minus 11 which occurred at Seneca on October 31<sup>st</sup>. The old record was minus 9 which occurred at Seneca and Freemont.

In addition to the cold there was an early season snowfall in the mountains and high plateaus. Three to six inches of snow fell in the Blue and Wallowa Mountains while varying amounts of a trace to three inches fell in the mountain valleys and high plateaus of central Oregon. Snow flakes were even observed in Pendleton on October 30<sup>th</sup>. This is a rare occurrence but not all that unusual. On October 31<sup>st</sup> 1973, Pendleton received 3.2 inches of snowfall.

## CHANGE TO OUR WEB SITE

You probably have already noticed the look of our web site has changed. This was done to conform to the National Weather Service Corporate Web Design. With this new design you should be able to go to any NWS web site and find the information you are looking for in the same general area. Your spotter information is still there. It is under "Weather Safety / Preparedness" then "Spotters". You will still be able to find the spotter report form, spotter training locations, where we need spotters and the spotter classroom. We will also be adding an electronic version of this newsletter to the site.

[www.wrh.noaa.gov/pendleton](http://www.wrh.noaa.gov/pendleton)

## Winter Criteria...Call When You See This

### EVENT

### WHEN/WHAT TO REPORT

**Heavy snowfall.....**One inch or greater per hour.

**Rainfall.....**½ inch or more in a short time.

**Freezing Rain.....**At initial onslaught and when impacts travel.

**Flooding.....**Any kind, including dam/levee failure. Is water rising/falling?

**Wind Damage.....**Wind speed of 40 mph or higher or any damage due to wind.

**Fog, Blowing Dust, ..**At initial onslaught of event when  
**& Blowing Snow** poor visibility impacts travel.

## NOAA Weather Radio Expansion Update

By Dennis Hull (WCM)

As of October 15, new NOAA Weather Radio transmitters are operating in the Columbia Gorge, Cle Elum, and Dayton, Washington. These radios were a cooperative effort between the National Weather Service and many federal, state, and local groups. The new NOAA Weather Radio Transmitters are WXM34 on frequency 162.400 Mhz located at The Dalles. It serves Skamania, Klickitat, Hood River, Wasco and Sherman counties. WNG566 on frequency 162.525 Mhz at Goldendale. It serves Klickitat, Sherman and Gilliam counties. KZZ73 on frequency 162.525 Mhz at Dayton, Wa. It serves Garfield and Columbia counties. Finally, WXN21 on frequency 162.400 at Cle Elum serves Kittitas county. In addition, NOAA Weather Radio transmitters are expected near Fossil and John Day Oregon in the near future. Thanks go out to Washington State Emergency Management, US Department of Agriculture Rural Utilities Service, Kittitas County, Q-104 Radio, Sherman County, Gilliam County, Wasco County, Columbia County (Washington), and Rural Oregon Wireless TV for funding, installing, or operating these weather radio transmitters.

## Final Note...

As always, local weather observations can be found on our NWS Pendleton Internet website.

<http://www.wrh.noaa.gov/pendleton/data/text/pdxhwsch.html> This collection includes official weather data from airport sites and unofficial data from home weather stations, schools and roadways sensors.